AMERICAN PIPELINE SOLUTIONS

*Pipeline Services, Products & Equipment*

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# Benefits of Pigging

**Improves operational efficiency & capacity:** Pigging improves operational efficiency by reducing pump pressure and increasing flow rates, saving time and money.

**Extends pipeline life:** Pigging helps to extend the life of pipelines by removing debris and contaminants that cause corrosion and other damage, saving money on repairs and replacement costs.

**Reduces downtime:** Pipelines can be pigged and inspected without shutting down, setting up bypasses, or installing numerous clean-outs, which reduces downtime and saves money. Pigging only needs a place for insertion and retrieval, like a terminus manhole.

**Reduces bacteria build-up:** Pigging helps reduce hydrogen sulfide build-up and smell in pipelines by removing the gas and air pockets from the pipeline. Pigging also removes debris and contaminants that can serve as a breeding ground for bacteria that produce H2S.

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# Foam Pigging

- This type of pigging effectively cleans and removes debris from the interior of pipelines using a foam device propelled by the **normal flow**. The technique is especially effective for force main & wastewater management, long runs, and larger diameter pipelines.
- Foam pigs can easily compress up to 50% of their original size to navigate 90-degree bends and other tricky geometry. This also allows it to do multidimensional pipes.
- Can clean miles of pipe in a single run.
- Used for Ductile Iron, Lined-Steel, HDPE, and PVC.
- APS Pipe Size: 3" – 60"
- Can be tracked throughout the cleaning process

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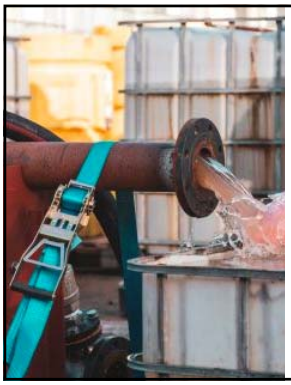

# APS PVP

- A pig designed explicitly for American Pipeline Solutions with the capability of navigating through plug valves
- Made from a proprietary gelatin solution
- It can be launched like a traditional foam pig
- Has successfully cleaned miles of pipeline this year ranging in size from 8-16"

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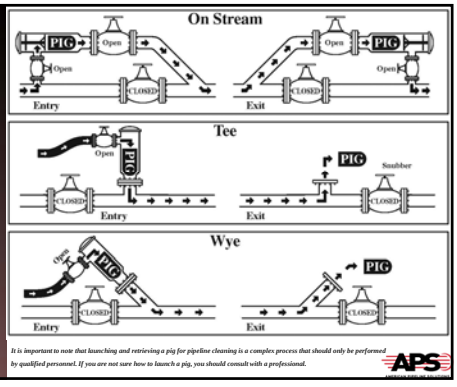
# Launching & Retrieving Methods




*It is important to note that launching and retrieving a pig for pipeline cleaning is a complex process that should only be performed by qualified personnel. If you are not sure how to launch a pig, you should consult with a professional.*

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## Ice Pigging

- Very short downtime
- Guaranteed not to get stuck
- Adapts to changing diameter
- Easy access via existing fittings
- Will pass through butterfly valves
- No need for disinfecting afterward
- 50% less water than flushing & more effective

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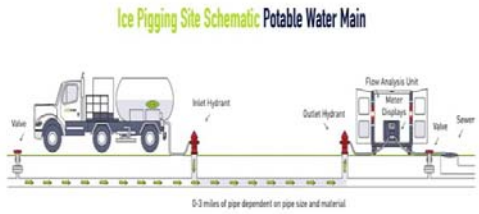
## Ice Pigging Process (Water Mains)

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## CURRENT STATUS

- **420+ PROJECTS IN US CLEANING 1,500+ MILES ACROSS 45 STATES**
- **MAXIMUM LENGTH CLEANED WITH 1 LOAD – 2.3 MILES**
- **2"- 42" DIAMETER PIPE CLEANED**
- **TECHNIQUE ALSO DEVELOPED FOR SEWER FORCE MAINS AND SIPHONS**
- **APS ONLY ICE PIGGING COMPANY IN US**

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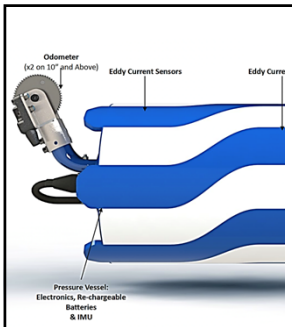


## Smart Pigging

- It is made and operates like a traditional foam pig but can inspect the pipeline like a conventional smart pig .
- Data quality is excellent as the foam acts as a signal dampener.
- The SmartFoam has an odometer, IMU, and caliper function in an all-in-one design.
- It's a low-risk but high-value solution.

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## Smart Pig Capabilities

- **Works on ferrous and non-ferrous pipe**
- **Navigate 90's**
- **Will inspect pipes from 3-60"**
- **Not sensitive to speed variations – speed range 0.1m/s - 8m/s**
- **Very sensitive to pits, internal metal loss and circumferential cracking**
- **Can inspect through nonconductive liners including cement lined pipe and HDPE**

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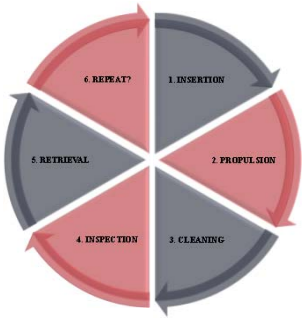
## HOW DOES THE PIGGING PROCESS WORK?

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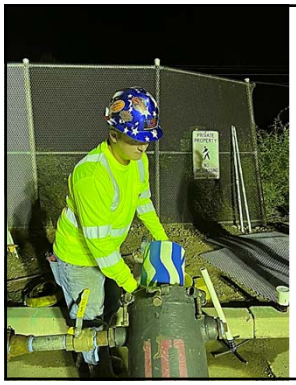

## Work Hours and Insertion

A successful 8" force main condition assessment. We often work at night when its too hot or the client wants to minimize impact of cleaning operations on the surrounding area.

**INSERTION:** The pig is inserted through a launching point, which is designated by technicians based on pig size.

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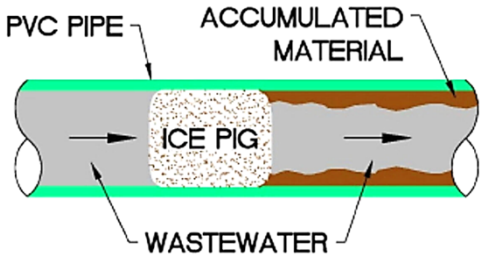
## PROPULSION

**Propelled forward by force of the force of fluid behind it, the pig is pushed along the length of the pipeline.**

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## CLEANING

**If the pig is a cleaning pig, it runs through the line, scraping the interior walls and removing debris.**

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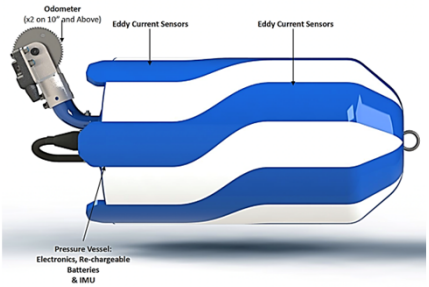
## INSPECTION

**Sensors, cameras, and other instruments collect data about the condition of the pipeline. These pigs, called Smart Pigs, can measure wall thickness, identify corrosion, and provide valuable insights into the health of the pipeline.**

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## RETRIEVAL

**The pig reaches the end of the pipeline or a designated retrieval point, such as a pig receiver. At this point, the flow of the substance might be temporarily halted or redirected, allowing the pig to be retrieved from the pipeline.**

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## HOW DOES THE PIGGING PROCESS WORK?

1. INSERTION: The pig is inserted through a launching point, which is designated by technicians based on pig size.
2. PROPULSION: Propelled forward by force of the force of fluid behind it, the pig is pushed along the length of the pipeline.
3. CLEANING: If the pig is a cleaning pig, it runs through the line, scraping the interior walls and removing debris.
4. INSPECTION: Sensors, cameras, and other instruments collect data about the condition of the pipeline. These pigs, called Smart Pigs, can measure wall thickness, identify corrosion, and provide valuable insights into the health of the pipeline.
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